

REVISED IOWA STATE ENERGY CONSERVATION PLAN:

1979 - 1980

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PREFACE

Iowa will continue participating in the federal energy conservation programs established under Public Laws 94-163 and 94-385, currently administered by the United States Department of Energy (DOE).

The Revised Iowa Energy Conservation Plan: 1979-1980 is a blue print for the state's continued participation. The original Plan contained descriptions of more than 70 programs underway or conceived for state implementation with federal dollars. The Revised Plan contains only those programs to be funded in Federal dollars. The projects include five mandatory programs identified by DOE and several projects selected for funding by the Iowa Energy Policy Council (EPC), the policy making board which governs the state energy agency. The 18- member Council selected the conservation programs at its March 20-21, 1979 meeting. The Council retains the right to amend both the Plan and the budget at any time for the duration of the three-year program.

The revised plan concentrates on saving finite petroleum and natural gas fuels in three sectors, - . government, residential, and transportation. The council believes state and local governments should be examples of conscientious energy use. Therefore the council has elected to emphasize government programs for building energy management and government employee mass transit. Local governments will participate in the new school, hospital and local government building energy audit program and benefit from procurement practices that take energy conservation into account.

Residential energy users will be able to participate in several types of home energy audits to be offered by the council and by Iowa fuel and energy suppliers.

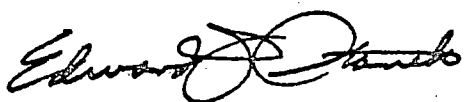
Primary thrust of the Plan was to achieve a seven percent reduction of projected 1980 state energy consumption by implementing the mandatory and voluntary programs identified as well as monitoring and encouraging other energy conservation measures underway in the state.

However, initial estimates of energy saved from the first two years of the program indicate Iowa's citizens have already almost achieved this goal. Under the revised plan, Iowa aims to exceed original projected savings.

The energy savings projected represent possibilities and achievable goals. Actual energy savings can be measured only after appropriate methodologies are developed. The Council may increase the agency's ability to measure actual savings and develop a reliable information base by adding computer capabilities to its pool of available resources.

Conservation staff will continue to issue quarterly progress reports and an annual report to DOE as required. Quarterly reporting will be done using the Energy Research and Development Administration's grants management system on a voluntary basis.

The Iowa Energy Policy Council respectfully submits this revised plan to the Federal Department of Energy, Washington, D.C.

A handwritten signature in dark ink, appearing to read "Edward J. Stanek". The signature is fluid and cursive, with a large, stylized initial "E".

Edward J. Stanek
Executive Director
Iowa Energy Policy Council

II. MANDATORY ENERGY CONSERVATION PROGRAM MEASURES

Iowa will continue to implement the five mandatory programs required under the Energy Conservation and Policy Act of 1975 (ECPA) as follows:

Program 1: Mandatory Lighting Efficiency Standards for Public Buildings

a. Description: Section 420-35 subpart (a) of the State Energy Conservation Plans guidelines requires adherence to the following minimum criteria:

1. Be in place and ready for implementation throughout all political subdivisions of the state by January 1, 1978, unless an extension has been granted by DOE under §420.41(b)
2. Apply to all public buildings above a certain size, as determined by the state
3. For new public buildings, be no less stringent than a standard consistent with the provisions of Section 9 of ASHRAE 90-75
4. For existing public buildings, contain the elements deemed appropriate by the state.

b. Milestones: Two extensions have been granted by DOE under 420.4(b) of the federal guidelines for complying with the mandatory requirement that states establish a lighting standard for public buildings. The extensions were granted December 22, 1977, and September 8, 1978 (until December 31, 1979). Standards for new construction were established with adoption of 90-75 on January 1, 1978. The bill authorizing the state Building Code Advisory Council to adopt standards for new construction also originally contained provisions for existing buildings. This provision was deleted by the state legislature before the bill passed.

Training sessions were held to acquaint architects, engineers, and enforcement officials with the new code. Additional training is needed and some type

of monitoring should be undertaken to assess enforcement of the new code. Also, the fact that ASHRAE 90-75 itself may be modified or the building energy performance standards implemented means additional training of local officials will be imperative. Milestones for this program by calendar quarter include:

First quarter 1979: Sponsor legislation for mandatory public lighting standards. Program planning

Second quarter 1979: Series of five workshops for building code officials

Third Quarter 1979: Workshops continue. Workbooks are edited

Fourth Quarter 1979: Monitor training results and code enforcement

1980: Assess program results

c. Estimated Energy Savings: Implementing the mandatory lighting efficiency standards will save energy by reducing lighting levels in new public buildings. Savings are estimated using the Iowa building inventory (described in Appendix D) and the Stanford Research Institute Methodology for Estimating Energy Savings for State Conservation Plans. Calculations of savings are presented in Appendix E. As a result of mandatory lighting efficiency standards, 2.20 trillion Btu's of fuel for electric generation is expected to be saved by 1980.

d. Estimated Program Costs

\$34,623.09

e. Environmental Residuals: The mandatory lighting efficiency standards program will lead to reduced emissions from electric power generation.

Program 2: Programs to Promote the Availability and Use of Carpools, Vanpools
and Public Transportation

a. Description: Section 420.35 subpart (b) of the State Energy Conservation Plans guidelines requires adherence to the following minimum criteria:

1. Have at least one of the following actions in place and ready to implement by January 1, 1978, in at least one urbanized area with a population of 50,000 or more within the state or in the largest urbanized area within the state if that state does not have an urbanized area with a population of 50,000 or more:
 - (i) a carpool/vanpool matching and promotion campaign; (ii) park-and-ride lots; (iii) preferential traffic control for carpools and transit patrols; (iv) preferential parking for carpools and vanpools; (v) variable working schedules; (vi) improvements in transit level of service; (vii) exemption of carpools and vanpools from regulated carrier status; (viii) parking taxes, parking fee regulations or surcharge on parking costs; (ix) full-cost parking fees for state and/or local government employees; (x) urban area traffic restrictions; (xi) geographical or time restrictions on automobile use; or (xii) area or facility tolls; and
2. Be coordinated with the relevant Metropolitan Planning Organization unless no Metropolitan Planning Organization exists in the urbanized area, and not be inconsistent with any applicable federal requirements.

Under contract with the state Department of Transportation (DOT) the EPC sponsored a carpool matching and promotion campaign in Des Moines. The campaign culminated in September, 1978, when the Governor proclaimed "Energy Conservation in Transportation Month" and recognized outstanding carpool/vanpool programs throughout the state as well as the employers who sponsored them.

The Council developed public service announcements promoting carpooling and distributed I-Pool T-shirt decals to students. Despite these promotional efforts, the carpool/vanpool program did not attract large numbers of riders. A DOT assessment of the Ames and Des Moines programs revealed that only 160 people joined carpools as a result of last year's promotional efforts. DOT recommends continuing the program at some level, with the following changes:

1. Give the program greater publicity but emphasize the social rather than the economic benefits of carpooling;
2. Develop a "hotlist" of people who want to carpool and keep it current;
3. Establish carpool incentives, such as free parking or a park-and-pool system, fair insurance rates for carpool drivers;
4. Do not use computer matching; it's too expensive for the number of people participating in the program at present.

Other efforts to conserve transportation energy have included: establishing flextime for state employees; exempting carpools and vanpools from regulated carrier status (Senate File 167), and improving bus ridership by subsidizing fares for state employees. The EPC wants to participate in this program during the coming year. Currently 1,200 state employees are purchasing monthly subsidized bus passes; another 600 are on a waiting list. Transit subsidies are a prohibited expense under the federal program, but EPC will assume the administrative costs of the project. These would include publicizing, staffing, and computerizing the program.

Other transportation programs are included in the Transportation Sector (VI) of this revised plan.

b. Milestones

First Quarter 1979: Monitor success of I-Pool demonstration

Second Quarter 1979: Contract with DOT for administration of state employee subsidy program. Contract for I-Pool promotion

Third Quarter 1979: Computerize employee subsidy program. Begin estimating energy savings.

Fourth Quarter 1979: Monitor program and savings

1980: Continue program; monitor results.

c. Estimated Energy Savings: Energy saved will be based on the number of riders attracted to the program. Methodolgy used to compute saved energy will be the same as used for this program last year on Iowa's U-535 forms.

d. Estimated Program Costs

\$52,623.17

e. Environmental Residuals: The transit subsidy program and I-Pool programs will reduce the number of cars on the road thereby decreasing air pollution, alleviating parking problems, and reducing traffic congestion during rush hours.

Program 3: Mandatory Procurement

a. Description: Section 420.35 subpart (c) of the State Energy Conservation Plan guidelines requires adherence to the following minimum criteria:

1. With respect to all State procurement and with respect to procurement of political subdivisions to the extent determined feasible by the State, be in place and ready for implementation by January 1, 1978, unless an extension has been granted by FEA under §420.41(b); and
2. Contain the elements deemed appropriate by the State to improve energy efficiency through the procurement practices of the State and its political subdivisions.

This program consists of two parts: (1) modify state procurement practices to foster energy conservation; and (2) facilitate the utilization of like modifications by political subdivisions.

b. Milestones: EPC has funded several research projects to determine the impact of life cycle costing on state procurement. These have included research on light bulb purchasing, air conditioner purchasing, vehicle procurement, heat pumps and large commercial washers. The Council plans to publish a booklet on procurement for local government. At its December meeting the Council named mandatory procurement standards for state government a legislative priority. The Council will push to make energy conservation an integral part of state procurement criteria.

Milestones for the calendar year include:

First Quarter 1979: Legislation requiring mandatory energy efficient procurement introduced.

Second Quarter 1979: Additional research on energy efficient procurement opportunities conducted.

Third Quarter 1979: Procurement booklet for local governments produced.

Fourth Quarter 1979: Procurement continues.

1980: Assess program.

c. Estimated Energy Savings: Savings within state government will be monitored from Department of General Services purchase records. Non-state savings can be measured by an annual survey of local governments if mandatory purchasing requirements are applied to political subdivisions. Other methodologies appear in Appendix F.

d. Estimated Program Costs:

\$40,123.17

e. Environmental Residuals: Improved procurement practices will benefit Iowa's environment. As more energy efficient vehicles are purchased, auto emissions will be reduced. As more efficient appliances and light bulbs are purchased, power plant emissions will be reduced.

Program 4: Mandatory Thermal Efficiency for New and Renovated Buildings

a. Description: Section 420.35 subpart (c) of the State Energy Conservation Plans guidelines requires adherence to the following minimum criteria:

1. Be in place and ready for implementation with respect to all buildings other than exempted buildings throughout all political subdivisions of the state by January 1, 1978, unless an extension of time has been granted by FEA under §420.41(b);
2. Take into account the exterior envelope physical characteristics, HVAC system selection and configuration, HVAC equipment performance and service water heating design and equipment selection;
3. For all new nonresidential buildings, be no less stringent than a standard consistent with provisions of sections 4-9 of ASHRAE 90-75.
4. For all new residential buildings, be no less stringent than either the HUD minimum property standards or a standard consistent with the provisions of sections 4-9 of ASHRAE 90-75; and
5. For renovated buildings, (i) apply to those buildings determined by the State to be renovated buildings; and (ii) contain the elements deemed appropriate by the State regarding thermal efficiency standards for renovated buildings.

b. Milestones: ASHRAE 90-75 standards were implemented January 1, 1978. Building officials and architects were trained as per mandatory program 1 and future plans would be similar for this program. Milestones for each calendar quarter would include:

First Quarter 1979: Contract for program development.

Second Quarter 1979: Series of five workshops for building code officials planned.

Third Quarter 1979: Workshops conducted. Workbooks edited.

Fourth Quarter 1979: Evaluation of code enforcement.

1980: Assess program.

c. Estimated Energy Savings: Implementing the mandatory thermal efficiency standards will save energy by reducing the heating levels in new public buildings. Savings are calculated using the Iowa housing and building inventory data described in Appendix D and the SRI Methodology for Estimating Energy Savings in State Energy Conservation Plans.

d. Estimated Program Costs

\$34,623.17

TOTAL

e. Environmental Residuals: Mandatory thermal standards for new buildings will require that more energy efficient buildings be constructed, lessening the demand for additional power plant capacity and decreasing power plant emissions. An estimated 18 trillion Btu's will be saved over the three year period of the plan.

Program 5: Traffic Law or Regulation to Allow Right Turn on Red Light After Stopping

a. Description: Section 420.35 subpart (e) of the State Energy Conservation Plan guidelines required adherence to the following criteria:

1. Be included in a state's motor vehicle code and ready for implementation through all political subdivisions of the state by January 1, 1978, unless an extension has been granted by FEA under §420.41(b); and
2. Permit the operator of a motor vehicle to make a right turn (left turn with respect to the Virgin Islands) at a red traffic light after stopping, except where specifically prohibited by a traffic sign; provided that such turn may be permitted only where specifically authorized by a traffic sign if the state demonstrates that, with respect to its jurisdiction, this approach permits right-turn-on-red after stopping to the maximum extent practicable with safety.

b. Milestones: The state of Iowa inaugurated RTOR prior to December 1976. Thus, no further mention of this program and the savings derived from it is made herein, because such savings cannot be credited to this plan under the guidelines.

III. ENERGY CONSERVATION PROGRAMS FOR THE AGRICULTURAL SECTOR

Program 2: Energy Saving Education Programs for the Farm

a. Description: The objective of these programs is to prepare a collection of case histories, fact sheets, and slide shows demonstrating energy conservation opportunities as well as measures already implemented on Iowa farms. (Energy efficient farming practices could be demonstrated at the Living History Farm of the Future.) Four fact sheets have been prepared and distributed to farmers through the agricultural extension service at Iowa State University. Slide shows have also been prepared and distributed. Additional materials will be prepared and distributed as needs are identified. In addition, the Council will cooperatively produce another farm fuel report with the Iowa Department of Agriculture (included under special publications, Supplemental Plan, Program 1).

b. Milestones

First Quarter 1979: Prepare slide show on alternative energy sources for the farm. Prepare conservation tillage exhibit for farming shows in Des Moines and Omaha/Council Bluffs.

Second Quarter 1979: Complete and distribute alternative energy sources slide show.

Third Quarter 1979: Prepare publication on solar heating in swine buildings and distribute.

Fourth Quarter 1979: Evaluate program. Plan for 1980.

1980: Continue disseminating conservation information until funding expires.

c. Estimated Energy Savings: Energy savings will be estimated for this program using data gathered in the farm fuel report, crop and livestock reporting data, Iowa State University statistics and the methodologies developed by the state and reported to DOE on the V-535 forms October 31, 1978.

d. Estimated Program Costs:

\$47,223.17

The funds for the farm fuel survey are accounted for under Special Publications, Supplemental Plan, Program 1.

e. Environmental Residuals: No adverse environmental effects are assessed to this program.

IV: ENERGY CONSERVATION PROGRAMS FOR THE GOVERNMENT SECTOR

Initially, Iowa implemented four programs for government under its revised Energy Conservation Plan: a solar demonstration project at the State Capitol Complex; a program for school building energy conservation; a program of local government building energy conservation; and a program for state building energy management. Because the state will soon receive funds for school, hospital and local government energy conservation audits (under the National Energy Conservation Policy Act), the Council will discontinue programs for these sectors under its revised plan (programs 4 and 8). The Council will continue to staff an advisory committee setting up the schools, hospitals, and local government program, but this activity will be reported under the Intergovernmental Coordination program in the revised supplemental plan.

The Council maintains that state government should be an example to energy conservation consciousness and will activate several other program measures from the original plan as well as focus attention on its energy management plan for state buildings.

Program 3: Solar Demonstration at the State Capitol Complex

a. Description: Two hundred square feet of high temperature solar collectors have been installed as a demonstration project at the State Capitol Complex. The collectors will help provide heating and cooling to the complex. The project is being supervised by staff hired under the mandatory procurement program. The Council also hopes to establish an energy room at the complex's physical plant near the collectors.

c. Milestones

First Quarter 1979: First banks of collectors installed at the complex.

Second Quarter 1979: Collectors operational.

Third Quarter 1979: Monitoring collector performance.

Fourth Quarter 1979: Calculate fossil fuel saved by use of solar supplemental.

1980: Begin outfitting energy room (see supplemental plan, program 1: Public Education).

c. Estimated Energy Savings: Savings are not assessable at this time. A methodology for computing savings is being developed.

d. Estimated Program Costs:

\$5,607.55

e. Environmental Residuals: The effect of the solar installation on the environment is not known at this time, but a potential beneficial effect is reduced air pollution as the collectors reduce demand for electric power generation.

Program 5: Energy Management Plan for State Buildings

a. Description: Under this program, state-owned and operated buildings have been identified and field surveys conducted on a sample of representative buildings. In addition, the state contracted for Class A type audits on 12 buildings in November, 1978, to gain experience with the Class A audit procedure and, from results of the audits, to identify the types of energy conservation measures that could be implemented to cut consumption.

The state legislature is now considering an appropriation request from the Energy Policy Council, the state Board of Regents, and the Department of Transportation to implement the state building energy management program. The Council expects to receive a \$3 million appropriation to conduct energy audits on 14 state agencies' buildings and to fund conservation projects in about half of them. With these funds, the Council will implement Phase V of the building management program: selection of buildings for auditing and retrofitting. Federal dollars will be used to coordinate the project.

b. Milestones:

- First Quarter 1979: Introduce legislation to appropriate funds for conservation projects.
- Second Quarter 1979: Monitor legislative activity: purchase meters.
- Third Quarter 1979: Install meters and begin data collection; begin selection of buildings to retrofit; coordinate program with Regents institutions and Department of Transportation.
- Fourth Quarter 1979: Continue metering and installing retrofit materials.
- 1980: Continue retrofit with state dollars. Monitor project results. Select additional buildings for improvement.

- c. Estimated Energy Savings: Energy savings are a function of current and projected consumption, the degree to which short and long term conservation measures are applied, and the potential savings from those applications. Savings accumulated in state owned or operated buildings were estimated to be on the order of 28 trillion Btu's by 1980. That estimate will have to be revised because the legislative appropriation for this portion of the program was not approved. The methodology for calculating energy savings in existing buildings appears in Appendix F.

d. Estimated Program Costs:

\$403,215.17

- e. Environmental Residuals: The program has beneficial environmental side effects. As the improved buildings become more energy efficient, the demand for electricity will be reduced, lessening the air pollution associated with power plant generation.

Program 6: Government Employee Travel Reduction

a. Description: This program concentrates on efforts to reduce auto travel by state employees to the minimum necessary. A reduction could be accomplished by effectively planning trips, combining staff trips, and requiring the use of mass transit where available.

b. Milestones:

First Quarter 1979: Contract General Services.

Second Quarter 1979: Study pooling options, plan travel reduction and set goals.

Third Quarter 1979: Implement program.

Fourth Quarter 1979: Continue program and monitor results.

1980: Continue program: evaluate results.

c. Estimated Energy Savings: Savings are not calculated at this time, but could be estimatee by comparing authorized travel requests and gasoline figures maintained by the state vehicle dispatcher.

d. Estimated Program Costs:

\$29,623.17

e. Environmental Residuals: Air Pollution should be reduced as employees cut back on state auto travel and pool rides.

V. RESIDENTIAL ENERGY CONSERVATION PROGRAMS

Program 7: Ban Open Pilot Lights on New Gas Appliances and Other Nonessential

Natural Gas Uses

a. Description: In 1977, the Iowa State Legislature passed a bill mandating the state Commerce Commission to certify intermittent electronic ignition devices for at least three gas appliances offered for sale in Iowa, including: residential or commercial furnaces, air conditioners, ranges and/or dryers. The Commission determined that all new gas dryers and air conditioners sold in the state are already equipped with intermittent ignition devices. The Commission established an advisory task force to recommend specifications of the remaining appliances. The task force met February 20 and voted to recommend specifications for central furnaces (including gas fired gravity, direct vent, and forced air), ranges and automatic valves for gas appliances. The task force concluded that their recommendations are consistent with protection of public health and safety, will result in conservation of natural gas, and gave proper consideration to costs, including initial costs of installation, maintenance costs, and life cycle costs. The recommendations will be forwarded to the Commerce Commission from the advisory task force. The Commission will continue to monitor the progress of this program.

b. Milestones

- First Quarter 1979: Advisory task force forges recommendation to Commerce Commission.
- Second Quarter 1979: Commerce Commission receives and acts on recommendations.
- Third Quarter 1979: Specifications approved and plans made for enforcement.
- Fourth Quarter 1979: Monitor program progress.

1980: Monitor progress.

1981: Appliances not equipped with intermittent device no longer sold in the state.

c. Estimated Energy Savings: Savings will be based on the number of appliances sold, the rate those equipped with intermittent ignition devices are introduced to the market, and the annual quantity of gas used per unit. Savings as calculated in previous conservation plans will be modified to account for the later date at which this program became effective. Savings will not be realized from clothes dryers as those sold in Iowa are already equipped with intermittent devices. The ICC did not address water heaters in its study, so the council will not claim savings from that appliance either. The following table estimates savings from the remaining appliances.

PILOT LIGHT GAS CONSUMPTION DATA

	<u>Total</u> <u>1970</u>	<u>Number</u> ¹ <u>1980</u>	<u>Replacement</u> ² <u>Rate (%/yr)</u>	<u>Additions</u> <u>and Re-</u> <u>placements</u> ³ <u>1978-80</u>	<u>Pilot Use</u> ⁴ <u>(Btu/yr)</u>	<u>Gas Saved</u> <u>in 1980</u> <u>(Btu)</u> ⁵
Furnaces	675,318	695,000	3.3%	72,760	6×10^6	0.44×10^{12}
Cooking Ranges	534,988	575,000	10.0%	172,501	3×10^6	0.52×10^{12}
Total	<u>12,103.06</u>	<u>12,700.00</u>	<u>13.3%</u>	<u>245,261</u>	<u>9×10^6</u>	<u>96×10^{12}</u>

¹ 1970 data from 1970 census of housing, U.S. Bureau of the Census; 1980 data estimated from 1970-80 Iowa Housing Inventory, Table D-4, Appendix D.

² Assumes 30 year life for furnaces, 10 years for others.

³ Additions at 0.3 of 1970-80 increases; replacement at replacement rate x 1970 population x 3 years

⁴ American Gas Association data, adjusted. Clothes dryers assumed to be only 50% equipped with constant pilot lights.

⁵ Additions + replacement x pilot use.

$$\text{Net Natural Gas Savings} = 1.59 \times 10^{12} \times 0.79 = 1.26 \times 10^{12} \text{ Btu}$$

$$\text{Net LPG Savings} = 1.59 \times 10^{12} \times 0.21 = 0.33 \times 10^{12} \text{ Btu}$$

$$1.6 \times 10^{12} \text{ Btu}$$

d. Estimated Program Costs:

\$5,607.55

e. Environmental Residuals: A slight increase in air pollution could occur as consumers switch from gas to electric pilot lights.

Program 8: Appliance Efficiency Standards

a. Description: This program has been inactive because the National Energy Conservation and Policy Act, Title IV, Part 2, which establishes an appliance efficiency standards program for 13 appliances, automatically preempts state appliance efficiency standards promulgated after January 1, 1978. The Council had hoped to publish a series of brochures comparing energy efficient appliances but has received word that the Air Conditioning and Refrigeration Institute will not publish its Directory of Certified Unitary Air Conditioners, Air-Source Unitary Heat Pumps, Sound-Rated Outdoor Unitary Equipment, and Central System Humidifiers because some manufacturers have not been able to complete DOE tests used to establish the ratings. The Council will continue monitoring the federal program and publish the brochures when information is available.

b. Milestones:

First Quarter 1979:	Monitor federal program
Second Quarter 1979:	Monitor federal program
Third Quarter 1979:	Publish brochures
Fourth Quarter 1979:	Distribute brochures
1980:	Evaluate Program

c. Estimated Energy Savings: Savings are a function of efficient appliances purchased and used. The council will develop methodology for this program based on sales of appliances to Iowa's.

d. Estimated Program Costs:

\$5,607.55

e. Environmental Residuals:

N/A

Program 13: Weatherization of Low-Income Residences

a. Description: Weatherization is a federal program that assists low-income homeowners in insulating, installing storm windows and doors, and weatherstripping their residences. Iowa has currently about 60,000 low-income, owner-occupied residences. Of these, 58% (or about 35,000) are occupied by the low-income elderly. The federal program first applied to about 7,000 homes occupied by low-income persons of all ages, and the state program first applied to about 2,100 homes occupied by the low-income elderly. There is no longer a state program, but continued federal funding from several sources is financing current weatherization efforts. True estimates of the number of home weatherized are difficult to make because the program initially weatherized homes with temporary materials. Some of the same homes have now been weatherized with more permanent materials. Best estimates from the Office of Planning and Programming are that about 15,000 homes are now weatherized.

Labor is not a cost to these programs as it is being funded by various training and employment programs. The federal program will probably continue, with EPC involved in a monitoring role.

b. Milestones:

- First Quarter 1979: Monitor weatherization success.
- Second Quarter 1979: Coordinate existing program with newly-mandated residential energy conservation program.
- Third Quarter 1979: Gather Btu savings estimates from weatherization program.
- Fourth Quarter 1979: Continue monitoring program and collecting savings data.

c. Estimated Energy Savings: Energy savings for this program will depend on the number of low-income families receiving the service, the average thermal efficiency of their residences, and the standards of upgrading to be applied. Assuming that the program will service 840 residences per year or 2,520 over the 1978-80 period, the estimated energy savings would be:

$$\begin{aligned}\text{Program savings} &= 2520 \times 0.15 \times 86 \times 10^6 \\ &= 0.03 \times 10^{12} \text{ Btu (1980)}\end{aligned}$$

Distribution of Savings by Fuel Type:

<u>Fuel</u>	<u>%</u>	<u>1980 Savings Btu x 10¹²</u>
Electricity	20%	0.006
Natural Gas	51%	0.015
Distillate	15%	0.005
LPG	13%	0.004
Coal	1%	--
		<u>0.030</u>

d. Program Costs:

\$5,607.55

e. Environmental Residuals: The principal environmental impact of this program is the favorable reduction of air pollution association with a saving of 0.03×10^{12} Btu of residential heating and cooling energy at the point of use.

Program 14: Voluntary Thermal Upgrading of Residence:

a. Description:

A major conservation effort has been directed at residential energy consumers. This effort will continue as Iowa responds to the National Energy Conservation Policy Act's mandate to establish a residential energy conservation program. The Council will cooperate with the Iowa Commerce Commission to insure that conservation programs currently underway are not duplicated as the state implements this program. The Council will fund portions of the program relating to non-regulated fuel suppliers, including development of conservation material and training of residential auditors.

The Council has already purchased, and the state's lending institutions are distributing Class C energy audit materials for homeowners. Under its Supplemental Plan (Program 3: Energy Audits), the Council bought 100,000 home energy savers manuals for distribution this spring.

A second program which addresses residential conservation is the weatherization program previously described. It is directed to low income homeowners.

A third program for homeowners is aimed at owners of single family residence. In Iowa, single family residences constitute 78 per cent of the total residences, and an estimated 90 per cent are owner-occupied. About two-thirds of these residences lack adequate insulation and other energy conserving features. The voluntary thermal upgrading program aims at convincing homeowners that thermal upgrading is a cost effective energy conservation measure. The Council contracted with the Iowa State University Cooperative Extension Service to develop and implement this program during the past year. ISU created a computer-assisted home energy audit program and constructed a traveling display that depicts energy conservation materials and techniques.

The program travels to shopping centers, malls, churches, county fairs, and community centers throughout the states. Homeowners visit the display and complete a simple computer form describing their home's physical characteristics and energy system. Trained extension personnel interpret the computer's analysis of the form and counsel homeowners about conservation opportunities in their particular residence. ISU extension personnel have conducted about 5,000 audits at 90 sites.

At its December 20, 1978 meeting, the Council voted to extend the contract for the computer-assisted home energy audits through March, 31, 1979, by which time the Council would have revised the entire conservation plan.

b. Milestones:

- | | | |
|---------------|-------|---|
| 1st. quarter, | 1979: | Extend contract through April to continue computer audits. Hire and train Clerk II to operate terminal. |
| 2nd quarter | 1979: | Begin development of home conservation kits for distribution at audit sites. Continue audits. Begin hands-on workshops as follow-up to audit. |
| 3rd quarter | 1979 | Complete conservation kits. Continue audits. Begin updating conservation |
| 4th quarter | 1979: | Assess program; continue audits. |
| 1980: | | Continue audits; assess program. |

c. Estimated Energy Savings:

The potential energy savings from this program depend on the number of single-family homeowners who decide to upgrade their residences, the existing average residential thermal efficiency and the average thermal efficiency attained by those who participate in the program.

As previously estimated, it would be cost effective for 50 per cent of the existing family residence homeowners to upgrade their homes. When the 60,000

homes owned by low income families are deducted from the inventory of 855,000 single family residences in Iowa, 800,000 residences are identified as eligible for this program and about half or 400,000 could benefit from upgrading. If 5% of the 400,000 owners take action the first year of the program, 10 per cent the second year, and 10% the third year, during a three year period, the total number taking action under this program (or taking equivalent measures on their own initiative as a result of incentives, public relations, and education) would be 100,000

Individual residence energy savings are estimated at 5 per cent. Program savings in Btu are then $0.15 \text{ savings} \times 0.75$ (ratio of heating and cooling to total residential energy) $\times (176.3 \times 10^{12} \text{ Btu per year for the residential sector } \div 1,149,000 \text{ residences in 1980}) \times 100,000 \text{ participants} = 1.73 \times 10^{12} \text{ Btu (1980)}$.

Distribution of Savings by Fuel Savings

Fuel	%	1980 Trillion Btu
Electricity	20	0.35
Natural Gas	51	0.88
Distillate	15	0.26
LPG	13	0.22
Coal	1	0.02
		1.73

d. Estimated Program Costs:

\$173,123.17

e. Environmental Residuals:

This program, like many of the others will reduce air pollution because of energy demand reduction once conservation measures are in place.

VI. ENERGY CONSERVATION PROGRAMS FOR THE TRANSPORTATION SECTOR

Program 10: Annual Vehicle Inspection

This program is inactive.

Program 12: Vehicle Registration Fees

This program will be deleted. Its purpose was to tax energy inefficient cars. This will be accomplished by the federal government when the gas guzzler tax becomes effective.

Program 13: State Vehicle Procurement Policies

a. Description: Over the past few years the state vehicle dispatcher has initiated a number of procurement practices that have increased the energy efficiency of the state's vehicle fleet. These include purchasing smaller cars, equipping state vehicles with radial tires, converting the state's truck fleet to diesel fuel, and purchasing experimental diesel cars. The Energy Policy Council would like to explore the possibility of purchasing and operating several non-petroleum fueled cars in the Capitol Complex-Greater Des Moines area.

b. Milestones

First Quarter 1979: Contact vehicle dispatcher and obtain data on cars.

Second Quarter 1979: If feasible to purchase cars, let bids.

Third Quarter 1979: Purchase cars and begin operating.

Fourth Quarter 1979: Monitor car performance.

c. Estimated Energy Savings: Energy savings assessable to this program are not computed at this time.

d. Program Costs: \$37,123.17

e. Environmental Residuals: Unknown.

Program 19: Driver Education

a. Description: Council staff has reviewed various driver education materials and purchased a film, "Saving Energy on the Road," for use by schools, civic groups, and the general public. However, a more pragmatic way of reaching teenage drivers has been proposed by one of the community action agencies: a teen "race for energy conservation." The demonstration project, if successful, could be a model for other community action agencies across the state.

The project will be organized for low income youth 16 to 19 years old over a period of six months in seven Iowa counties. Forty participants will compete against themselves in two driving events over a preselected course. Between the first and second races they will attend special workshops on energy efficient driving habits, car care and fuel efficiency. They will also be trained to compile data from which they can determine fuel efficiency of their cars before and after maintenance training. A film of the rally events will be made for use by other groups (with non-DOE funding).

b. Milestones

First Quarter 1979: Develop project proposal and scope of work.

Second Quarter 1979: Hire project supervisor, youth to operate project and provide training. Develop public relations campaign. Organize project.

Third Quarter 1979: Recruit youth participants. Conduct participant orientation. Conduct first driving event. Conduct second driving event and compile data. Film.

Fourth Quarter 1979: Print film. Evaluate project. Write final report.

1980: Expand rally to other counties.

c. Estimated Energy Savings: Fuel savings in properly maintained versus non-maintained autos will be measured by project participants. No estimated savings have been projected at this time.

d. Estimated Program Costs:

\$29,623.17

- e. Environmental Residuals: Properly tuned cars will emit fewer air pollutants.

VII: ENERGY CONSERVATION PROGRAMS FOR THE UTILITY SECTOR

Program 3: Utility Load Management

a. Description: The two types of peaks in electricity demand are time-of-day peaks (peaks during the day) and seasonal peaks. The daily peak during the summer peak determines the total capacity requirement of a utility.

In producing electricity, base load power facilities (facilities built to satisfy base demand) are more energy efficient than intermediate and peaking facilities (facilities designed to satisfy intermediate and peak demand). Typically the base load plants tend to be large and peaking plants small. Therefore, shifting electricity demand from peak to off-periods would allow increased use of intermediate and base facilities, reduce use of peak facilities and save energy (or fuel).

Reducing summer and daily peaks would mean that less capacity would be needed by the utilities, a larger fraction of the peaking type. Shifting daily peak demand to off-peak times may be accomplished in several ways-- through altering the rate structure--or through voluntary efforts by the consumer.

Under this program, the Council will conduct a demonstration project to assess the impact of utility curtailment of air conditioning during the summer cooling peak. Consumers will voluntarily participate in the program, which will be administered by an Iowa utility with EPC review.

b. Milestones:

First quarter 1979:	Program planning
Second quarter 1979:	Contract for program implementation
Third quarter 1979:	Utility begins program: selects participants
Fourth quarter 1979:	Program continues
1980:	Monitor and evaluate program.

c. Estimated Energy Savings:

Savings will depend on the number of families electing to participate in this program. Estimates are therefore not available at this time.

d. Estimated Program costs

\$114,623.17

e. Environmental Residuals

The program is expected to reduce air pollution by lowering the demand for additional power plant capacity.

Program 5: Utility Advertising for Energy Conservation

a. Description: Under the National Energy Conservation Policy Act passed by Congress last year, utility companies will be required to provide conservation information to their customers and, upon request, to provide audits of residences and arrange financing for conservation measures. The EPC will work with the Iowa Commerce Commission in implementing this program to meet the requirements of NECPA.

b. Milestones

First Quarter 1979: Assess impact of NECPA on residential conservation programs. Review existing utility conservation programs. Coordinate planning with Iowa Commerce Commission.

Second Quarter 1979: Review proposed rules for residential energy conservation program. Complete review of utility conservation programs.

Third Quarter 1979: Develop state plan for implementing program.

Fourth Quarter 1979: Submit state plan to DOE.

1980: DOE approves state plan. State implementation.

c. Estimated Energy Savings: Savings will depend on the number of homes audited and the type of energy conservation measures implemented in them. Savings should be easily monitored through utility billings.

d. Estimated Program Costs: \$18,823.17

e. Environmental Residuals: The program should have a beneficial effect on air quality. Power plant pollution will be reduced or avoided as demand is reduced through the conservation measures.

Program 7: Municipal Utility Study (new program)

a. Description: At its December meeting, the EPC identified several study priorities for the staff to investigate over the next year. One study question posed was: Should there be a future for municipal utilities in Iowa? Other issues were: How should the municipals gain access to power? Should municipal diesel generators be preserved for civil defense or other purposes? Should they be allowed to deteriorate and be dismantled? These questions need to be answered so that the council can establish a policy toward municipal power generation and distribution.

b. Milestones

First Quarter 1979: Identify study question and parameters.

Second Quarter 1979: Liaison with Municipal Utility Association to discuss study and identify data resources. Contract for study.

Third Quarter 1979: Study underway.

Fourth Quarter 1979: Study completed and staff recommendations to Council.

1980: Legislative action, if necessary.

c. Estimated Energy Savings: No savings are attributed to a study program.

d. Estimated Program Costs:

\$29,623.17

e. Environmental Residuals: No environmental effects are attributed to this study.

VIII. ENERGY CONSERVATION PROGRAMS FOR THE COMMERCIAL SECTOR

Programs 1 and 2: Energy Efficiency Sharing Workshops and Audit Services for Small Businesses

a. Description: The Council will work through the chambers of commerce and the Small Business Administration to conduct a series of energy efficiency sharing seminars for small businesses similar to the successful program already underway for industrial users. A Class B or Class C audit for the small business needs to be developed. The seminar could be a "town square" type of event and serve as the impetus for small business owners to receive audit training and then conduct audits on their own stores.

b. Milestones: The Council has purchased a series of slide shows on energy conservation for the small business owner and conducted one EES for small businesses.

First Quarter 1979: Program development.

Second Quarter 1979: Liaison with SBA, Chambers of Commerce.

Third Quarter 1979: Program underway.

Fourth Quarter 1979: Program continues. Audit results monitored.

1980: Program continues and is evaluated.

c. Estimated Energy Savings: Savings are not estimated but can be monitored through the energy audit program.

d. Estimated Program Costs

\$104,623.17

e. Environmental Residuals: No adverse environmental impacts will result from this program.

e. Environmental Residuals: No adverse environmental impacts will result from this program.

Program 3: Voluntary Conservation Programs for Hospitals

The Council sponsored two hospital energy efficiency sharing seminars last year which were very well attended. The second seminar was jointly sponsored by the State of Nebraska. Due to pending implementation of the schools, hospitals and local government program, the Council will not sponsor additional EES programs. However, hospital engineers will receive audit training at a special Class A energy audit program being designed for them. In addition, the EPC along with the federal Department of Energy and the American and Iowa hospital associations will sponsor a special two-day conference on hospital energy conservation and energy audits this May 30 - June 3, 1979.

IX. ENERGY CONSERVATION PROGRAMS FOR THE INDUSTRIAL SECTOR

Programs 1 and 2: Fiscal Policies for Industrial Conservation Measures and Industrial Energy Conservation Workshops

a. Description: The Council continues working through the Center for Industrial Research and Services on these two programs. Ten energy efficiency seminars have been held and CIRAS is now offering engineering evaluations to industrial firms as well. During the next year, CIRAS will evaluate results of an industrial conservation survey and rank alternatives according to cost benefit ratio and potential energy savings. CIRAS also plans to publish case histories of industrial firms in Iowa that have successful conservation programs underway. Finally, CIRAS will undertake a study to determine what state fiscal policies could be implemented to promote energy conservation.

b. Milestones

First Quarter 1979: Continue energy efficiency sharing seminars. Hire staff and begin planning for fiscal incentive study.

Second Quarter 1979: Continue EES's and continue study project. Continue providing technical assistance to industrial firms. Compute Btu savings from industrial firms served.

Third Quarter 1979: Publish book of industrial case histories and distribute.

Fourth Quarter 1979: Evaluate program and complete fiscal study.

1980: Continue program and assess results.

c. Estimated Energy Savings: End use energy consumption by the industrial sector in Iowa is incomplete. Once the study of conservation alternatives is completed, however, the Council should be better able to forecast potential energy savings that can be achieved in Iowa industry. A target goal for industrial programs is a five percent reduction of the 1980 forecasted consumption. If the five percent goal is achieved, energy saved by the industrial sector would amount to about 10.2 trillion Btu.

d. Estimated Program Costs:

\$72,193.17

Program 3: Mandatory Container Deposit Legislation

A. Description: To focus attention on implementation of Iowa's mandatory container deposit legislation, the council received DOE approval to partially finance the Great Iowa Cleanup a voluntary litter pickup campaign to emphasize the waste of resources and energy in litter itself and the necessary efforts to pick it up. Significant resources are expended over time to collect litter. A major effort to combine a year's worth of anti-litter efforts into a single day will dramatize the extent of resources that could be saved by more responsible public behavior. The energy savings in metals recycling will also be emphasized. A volunteer labor force of 20,000 to 30,000 people is being sought for an intensive one-day effort on May 5, 1979. The project is being coordinated by the EPC with involvement from several other state agencies and organizations, including the Red Cross, Department of Public Safety, Public Defense, the Conservation Commission, Department of Environmental Quality, Department of Transportation, Public Instruction, International Year of the Child Commission, and various service clubs.

b. Milestones:

- First Quarter 1979: GIC organization underway; planning committee of several agencies meets, establishes goals. Governor proclaims the Cleanup. Public relations campaign planned.
- Second Quarter 1979: County coordinators established for campaign. Public relations campaign launched. Volunteers sign up for project. GIC occurs May 5, Cans recycled by Alcoa.
- Third Quarter 1979: Outstanding contributions of volunteers, county coordinators service clubs recognized by the Governor.
- Fourth Quarter 1979: Legislation in effect and monitoring begins.
- 1980: Monitor effect of legislation.

c. Estimated Energy Savings: Energy saved in this project is represented by the cans recycled. Estimates will be made once Alcoa completes the pickup of recyclable material.

d. Estimated Program Costs:

\$60,208.37

e. Environmental Residuals: The environment will benefit from this project. The recycled cans will save natural resources and energy and the countryside will be cleaned.

Program 1: Public Education

a. Description: The public education program measure encompasses both programs directed at the general public and also, through a more formalized curriculum, programs for the "in-school" public. Under this program measure the Council will:

1. Revise the elementary energy conservation activity packets (ECAPS) of the state conservation program. Revisions will make the materials more current and will reflect teachers' experience in using the ECAPS. Funds are also budgeted for additional in-service workshops for elementary teachers;
2. Continue development of junior high age education material through contract with Nebraska 4-H;
3. Complete secondary education materials and conduct in-service workshops to train teachers to use them;
4. Continue producing a series of special publications for the general public; these include: (a) a brochure on energy efficient procurement for local government; (b) an expanded farm fuel report; and (c) energy materials for the Capitol Complex energy room;
5. Continue the speakers' bureau and press coverage of energy conservation programs;
6. Investigate participation in the community improvement projects;
7. Continue a statewide series of workshops on energy conservation and alternative energy sources;
8. Continue publishing a monthly energy bulletin;
9. Hire two interns part-time to assist the information specialist.

b. Milestones

First Quarter 1979: Program planning for 1979-80

Second Quarter 1979: Hire journalism and graphic artist interns to assist staff information specialist with special projects

Third Quarter 1979: Begin publishing special brochures

Fourth Quarter 1979: Review and revise materials

c. Estimated Energy Savings: No savings accrue directly to this program. The program maximizes savings in other programs.

d. Estimated Program Costs

\$162,971.75

Program 2: Intergovernmental Coordination

a. Description: The Energy Policy Council is the statutorily-created body that coordinates energy activities among various federal, state and local conservation programs. Its citizen, legislative and state agency members provide basic intergovernmental coordination. In addition, the Council has created several intergovernmental advisory committees which aid EPC in forming and implementing specific conservation programs. Advisory Committees exist for the following programs: II,2: Carpool/Vanpool; III,2: Agriculture Education; IV,4,3: School and Local Government; V,7: Intermittent Ignition Devices; IX,3: Great Iowa Cleanup; and Supplemental Programs 1: Secondary Education, Nebraska 4-H Film Series; and 3: Class A Audits.

The Council staff also serves on advisory committees for the Iowa Energy Extension Service and for the Residential Energy Conservation Program authorized by NECPA.

b. Milestones: These committees meet as necessary and serve in an advisory capacity. There are no milestones for this program.

c. Energy Savings: No energy savings accrue to this program measure.

d. Estimated Program Costs:

\$16,318.75

e. Environmental Residuals: No environmental residuals are assessed to this program.

Program 3: Energy Audits

a. Description

CLASS A AUDITS: Class A audits are performed by a qualified auditor who has conducted an on-site visit to the building. A Class A audit program for office buildings has been developed under contract with Iowa State University Engineering Research Institute. About 60 Class A auditors are "authorized" to perform the energy surveys. The program will be launched for office building owners in Des Moines sometime this spring. The Council plans to use the Class A auditors to conduct technical assistance portion of the schools, hospitals, and local government program. Additional revision on materials will be needed to offer seminars and workbook instruction to other target populations defined in DOE regulations, including: apartment buildings, educational institutions, hospitals, hotels and motels, bakeries, dye-casting plants, restaurants, retail stores, transportation terminals, and warehouse and storage facilities.

CLASS B AUDITS: Class B audits are completed by the building owner or occupant using a state distributed questionnaire and receiving state evaluation of the completed questionnaire. The computer-assisted home energy audit developed by Iowa State University Extension qualifies as a Class B residential audit. As the National Energy Policy Conservation Act Residential Energy Conservation program reaches implementation stage, the EPC will develop audit training materials, train and certify auditors, for use by the utility companies in meeting their obligations to NECPA. A possible workforce for this program is assessors or appraisers. The Council feels that although NECPA requires on-site audits, the depth of audit is more appropriately described as a Class B audit. Iowa's Class B audits are conducted by professionals.

CLASS C AUDITS: Class C audits for residential users include home energy savers manuals purchased by the Council and being distributed by the state's

tending institutions. The Council will investigate extending Class C audits to other types of users during the coming year. Distribution would not be limited to mailing workbooks; rather, we will attempt to combine workbook distribution with some type of training for the user (building operator).

b. Milestones

First Quarter 1979	Staff planning. Review of Class C audit materials. Continue Class A certification workshops.
Second Quarter 1979	Conduct Class A certification for hospital engineers. Continue Class A certification program for architects and engineers. Launch pilot project in Des Moines.
Third Quarter 1979	With ICC begin reviewing B audits for residential program. Plan workshops for C audits, non-office building category.
Fourth Quarter 1979	Adopt audit materials for residential program; begin training.
1980	Continue audit certification programs; continue audits. Implement residential program with utilities.

c. Estimated Energy Savings: Estimates are not available at this time.

d. Estimated Program Costs

\$302,671.36

Additional Program Measures

Consumer Protection: Consumer protection is the responsibility of the state Attorney General's office. EPC and the Attorney General sponsored a two-day insulation fraud hearing last summer. As a result, the Attorney General's office proposed and the EPC endorsed several measures designed to protect Iowa consumers from fraudulent claims and practices by insulation contractors. These included proposing infrared scans of homes which consumers feared were not insulated as promised by the contractor; proposing that the State require insulation contractors doing business in Iowa be registered by the state and be required to be bonded. Along with these recommendations, the Council proposed an education program for both the general public, and for the insulation contractors. The consumer education program would be designed to help consumers identify reputable contractors and select appropriate insulation materials for their homes; the contractor program would help train contractors to properly install insulation materials.

b. Milestones:

First Quarter 1979	Meet with Attorney General staff and discuss legislative proposals for requiring insulation contractor registration, bonding.
Second Quarter 1979	Begin drafting education materials for consumer protection brochures.
Third Quarter 1979	Publish insulation brochures. Plan insulation contractor workshops.
Fourth Quarter 1979	Conduct contractor training workshops.
1980	Continue program and monitor

c. Energy Savings Estimate: Not available.

d. Estimated Program Costs:

\$46,318.75

e. Environmental Residuals: None